

## CLAIMS

1. A surgical microscope, comprising:

a first housing, having an opening;

an objective optical system comprising an objective lens provided in the first housing, and a pair of relay lenses that are provided in the first housing and form first binocular luminous fluxes on the basis of the luminous flux incident through the objective lens;

a first binocular eyepiece optical system, provided in the first housing, and forming a first binocular optical image through the incidence of the first binocular luminous fluxes;

a splitting optical system, provided in the first housing, for splitting the first binocular luminous fluxes formed by the pair of relay lenses and thereby forming a plurality of split luminous fluxes including second binocular luminous fluxes that can exit at least through the opening;

a pupil splitting optical system, provided in the first housing, disposed at a pupil location substantially conjugate to the entrance pupil of the objective optical system, for splitting at least one of the plurality of split luminous fluxes so as to split the luminous flux at the pupil location, and thereby forming third binocular luminous

fluxes and enabling the third binocular luminous fluxes to exit through the opening;

a second housing, attached to the opening, and capable of being set to at least first and second rotational angles with respect to an axis parallel to the travel direction of the second binocular luminous fluxes exiting through the opening; and

a second binocular eyepiece optical system, provided in the second housing, forming a second binocular optical image on the basis of the second binocular luminous fluxes through the incidence of the second binocular luminous fluxes when the second housing is set to the first rotational angle, and forming a second binocular optical image on the basis of the third binocular luminous fluxes through the incidence of the third binocular luminous fluxes when the second housing is set to the second rotational angle.

2. The surgical microscope according to Claim 1, wherein the splitting optical system forms a first splitting optical system that transmits and guides light to the first binocular eyepiece optical system, and a second splitting optical system that reflects and guides light to the pupil splitting optical system side, through the incidence of the first binocular luminous fluxes.

3. The surgical microscope according to Claim 1, wherein, when the second binocular luminous flux and the third binocular luminous flux exit through the opening in the first housing, the second binocular luminous flux and the third binocular luminous flux pass locations substantially equidistant from the rotational axis of the second housing, on the basis of the arrangement of the objective optical system, the splitting optical system and the pupil splitting optical system.

4. The surgical microscope according to Claim 1, wherein the first housing has an objective housing that supports the objective optical system, an intermediate lens barrel housing that supports the splitting optical system and the pupil splitting optical system, and an eyepiece lens barrel housing that supports the first eyepiece optical system.

5. The surgical microscope according to Claim 4, wherein the intermediate lens barrel housing has the opening.

6. The surgical microscope according to Claim 1, wherein, in a state in which the second housing is set to the first rotational angle, the second binocular eyepiece optical system is oriented facing the first binocular

eyepiece optical system, in which state the second binocular luminous fluxes that is equivalent to the first binocular luminous fluxes are guided through the opening to the second binocular eyepiece optical system, and in a state in which the second housing is set to the second rotational angle, the second binocular eyepiece optical system is oriented to the side of the first binocular eyepiece optical system, in which state the third binocular luminous fluxes are guided through the opening to the second binocular eyepiece optical system.

7. The surgical microscope according to Claim 1, wherein the second housing is attached to the first housing freely rotatably around its center axis that is parallel to the direction of travel of the second binocular luminous fluxes exiting the opening.

8. The surgical microscope according to Claim 7, further comprising:

a third housing that supports the pupil splitting optical system and is disposed in the first housing so as to be rotatable around the same axis as the rotational axis of the second housing; and

a linking member that links the second housing and the third housing, transmits the rotational force of the second

housing to the third housing, and rotates the third housing in conjunction with the rotation of the second housing.

9. The surgical microscope according to Claim 1, wherein the second housing is attached removably to the opening of the first housing.

10. The surgical microscope according to Claim 1, wherein positioning means for positioning the second housing at the first rotational angle and the second rotational angle is provided.

11. The surgical microscope according to Claim 1, wherein the pupil splitting optical system splits each luminous flux of the second binocular luminous fluxes to form two pairs of third binocular luminous fluxes.

12. The surgical microscope according to Claim 1, wherein the pupil splitting optical system is formed from a pair of triangular prisms.

13. The surgical microscope according to Claim 1, wherein the splitting optical system comprises:

a splitting prism that is disposed on one of the optical paths of the second binocular luminous fluxes, and

splits one of the second binocular luminous fluxes into a transmitted luminous flux and a reflected luminous flux; and a luminous flux guide optical system that guides either the transmitted luminous flux or the reflected luminous flux to the pupil splitting optical system and guides the other to the opening.

14. The surgical microscope according to Claim 1, wherein the splitting optical system comprises:

a first splitting prism that is disposed on one of the optical paths of the first binocular luminous fluxes, and splits one of the first binocular luminous fluxes into a first transmitted luminous flux and a first reflected luminous flux; and

a second splitting prism that is disposed on the optical path where the first transmitted luminous flux is incident, and splits this flux into a second transmitted luminous flux and a second reflected luminous flux,

and the first reflected luminous flux is guided to the pupil splitting optical system, the second transmitted luminous flux forms one of the first binocular luminous fluxes, and the second reflected luminous flux forms one of the second binocular luminous fluxes.

15. A surgical microscope, comprising:

an objective optical system, including an objective lens that converges the luminous flux from a subject and a pair of relay lenses disposed facing the objective lens, and producing first binocular luminous fluxes on the basis of the luminous flux incident on the objective lens;

a pupil splitting optical system, disposed at a pupil location substantially conjugate to the entrance pupil of the objective optical system, for splitting at least one of the first binocular luminous fluxes at the pupil location and thereby producing second binocular luminous fluxes;

a binocular eyepiece optical system, producing an optical image for binocular observation on the basis of the first binocular luminous fluxes or the second binocular luminous fluxes; and

a housing, in which the objective optical system and the pupil splitting optical system are disposed such that the first binocular luminous fluxes and the second binocular luminous fluxes are located on substantially the same circumference, at the location where the first binocular luminous fluxes and the second binocular luminous fluxes are incident on the binocular eyepiece optical system, with the direction of travel of the first binocular luminous fluxes and the second binocular luminous fluxes parallel to the optical axis of the objective lens.

16. The surgical microscope according to Claim 15, wherein the binocular optical system is a first binocular optical system, and the surgical microscope further comprises a second binocular eyepiece optical system provided in the housing and on which the first binocular luminous flux is incident.

17. The surgical microscope according to Claim 15, further comprising a splitting optical system that is provided in the housing and splits the first binocular luminous flux when the first binocular luminous flux is incident thereon, guides light to the second binocular eyepiece optical system, and also guides light to the pupil splitting optical system.

18. The surgical microscope according to Claim 15, wherein the housing is designed such that the binocular eyepiece optical system can be detached from a different direction, with the rotational center being an axis where the first binocular luminous flux and the second binocular luminous flux are located on substantially the same circumference.

19. The surgical microscope according to Claim 15, wherein the housing allows the binocular eyepiece optical



system to rotate, with the rotational center being an axis where the first binocular luminous flux and the second binocular luminous flux are located on substantially the same circumference.

20. The surgical microscope according to Claim 15, wherein the housing is designed such that the objective optical system, the binocular eyepiece optical system, and an optical system that includes the pupil splitting optical system and emits two binocular luminous fluxes are housed in separate first, second, and third housings, respectively, and the first, second, and third housings are freely detachable from each other.

21. The surgical microscope according to Claim 15, wherein one of the first binocular luminous fluxes made by the pair of relay lenses is also used as the second binocular luminous flux made by the pupil splitting optical system.

22. The surgical microscope according to Claim 15, wherein the pupil splitting optical system and the binocular eyepiece optical system on which the binocular luminous flux produced by the pupil splitting optical system is incident rotate integrally around the same rotational center.

23. The surgical microscope according to Claim 15, wherein an optical reflection member that orients the first binocular luminous fluxes made by the pair of relay lenses so as to be parallel to the second binocular luminous fluxes emitted from the pupil splitting optical system is disposed between the pupil splitting optical system and the binocular eyepiece optical system on which the binocular luminous flux is incident.